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CoE 197S ME8 Documentation

Exercise 5: Volume

1. **Setting up the server**


```
PS C:\Users\whatanicedayiana> docker run --rm -d --name apache -p 80:80 httpd:2.4
Unable to find image 'httpd:2.4' locally
2.4: Pulling from library/httpd
69692152171a: Pull complete
7284b4e0cc7b: Pull complete
3678b2d55ccd: Pull complete
aeb67982a725: Pull complete
06954f8169fd: Pull complete
Digest: sha256:48bae0ac5d0d75168f1c1282c0eb21b43302cb1b5c5dc9fa3b4a758ccfb36fe9
Status: Downloaded newer image for httpd:2.4
52b740238ee830ca5cf9ed9480650493c3280e3527ca04c69b58134287de0be5
PS C:\Users\whatanicedayiana> curl localhost


StatusCode      : 200
StatusDescription : OK
Content         : <html><body><h1>It works!</h1></body></html>

RawContent      : HTTP/1.1 200 OK
                  Keep-Alive: timeout=5, max=100
                  Connection: Keep-Alive
                  Accept-Ranges: bytes
                  Content-Length: 45
                  Content-Type: text/html
                  Date: Fri, 11 Jun 2021 22:15:45 GMT
                  ETag: "2d-432a5e4a73a80...
Forms           : {}
Headers         : {[Keep-Alive, timeout=5, max=100], [Connection, Keep-Alive], [Accept-Ranges, bytes], [Content-Length, 45]...}
Images          : {}
InputFields     : {}
Links           : {}
ParsedHtml      : mshtml.HTMLDocumentClass
RawContentLength : 45
```

Fig. 1. Running Apache HTTPD server and query web server for the default page


```
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker cp index.html apache:/usr/local/apache2/htdocs/
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> curl localhost


StatusCode      : 200
StatusDescription : OK
Content         : <html><body><h1>It works in Docker!</h1></body></html>

RawContent      : HTTP/1.1 200 OK
                  Keep-Alive: timeout=5, max=100
                  Connection: Keep-Alive
                  Accept-Ranges: bytes
                  Content-Length: 56
                  Content-Type: text/html
                  Date: Fri, 11 Jun 2021 22:19:26 GMT
                  ETag: "38-5c48246130f00...
Forms           : {}
Headers         : {[Keep-Alive, timeout=5, max=100], [Connection, Keep-Alive], [Accept-Ranges, bytes], [Content-Length, 56]...}
Images          : {}
InputFields     : {}
Links           : {}
ParsedHtml      : mshtml.HTMLDocumentClass
RawContentLength : 56
```

Fig. 2. Replacing default base html with new index.html

```
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker stop apache
apache
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker run --rm -d --name apache  -p 80:80 httpd:2.4
d29cd71c481606b69d075d072e1721204125515837d6a810701c08a211d5447b
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> curl localhost


StatusCode      : 200
StatusDescription : OK
Content         : <html><body><h1>It works!</h1></body></html>

RawContent      : HTTP/1.1 200 OK
                  Keep-Alive: timeout=5, max=100
                  Connection: Keep-Alive
                  Accept-Ranges: bytes
                  Content-Length: 45
                  Content-Type: text/html
                  Date: Fri, 11 Jun 2021 22:21:53 GMT
                  ETag: "2d-432a5e4a73a80...
Forms           : {}
Headers         : {[Keep-Alive, timeout=5, max=100], [Connection, Keep-Alive], [Accept-Ranges, bytes], [Content-Length, 45]...}
Images          : {}
InputFields     : {}
Links           : {}
ParsedHtml      : mshtml.HTMLDocumentClass
RawContentLength : 45
```

Fig. 3. Stopping container autoremoves it, so another new container won't have previous changes

2. Managing volumes

```
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume ls
DRIVER     VOLUME NAME
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume create myvolume
myvolume
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume ls
DRIVER     VOLUME NAME
local      myvolume
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume rm myvolume
myvolume
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume ls
DRIVER     VOLUME NAME
```

Fig. 4. Listing, Adding and Removing Volumes

3. Mounting volumes on container

```
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker volume create httpd_htdocs
httpd_htdocs
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker run --rm -d --name apache -p 80:80 -v httpd_htdocs:/usr
/local/apache2/htdocs/ httpd:2.4
03dc19e935a11d0a52a0fe07edb0565779d8b3f45f4959f911bc16e3f4a5e24a
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker cp index.html apache:/usr/local/apache2/htdocs/
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> curl localhost


StatusCode      : 200
StatusDescription : OK
Content         : <html><body><h1>It works in Docker!</h1></body></html>

RawContent      : HTTP/1.1 200 OK
                  Keep-Alive: timeout=5, max=100
                  Connection: Keep-Alive
                  Accept-Ranges: bytes
                  Content-Length: 56
                  Content-Type: text/html
                  Date: Fri, 11 Jun 2021 22:29:27 GMT
                  ETag: "38-5c48246130f00...
Forms           : {}
Headers         : {[Keep-Alive, timeout=5, max=100], [Connection, Keep-Alive], [Accept-Ranges, bytes], [Content-Length, 56]...}
Images          : {}
InputFields     : {}
Links           : {}
ParsedHtml      : mshtml.HTMLDocumentClass
RawContentLength : 56
```

Fig. 5. Creating new volume, and re-running *docker run* command

Fig. 6. File changes still seen even though *stop apache* command is used

4. Mounting host directories on containers

Fig. 7. Mounting local directory onto containers – when index.html is modified, file changes take place immediately

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```
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker stop apache
apache
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes> docker ps -a
CONTAINER ID    IMAGE      COMMAND    CREATED    STATUS     PORTS      NAMES
PS C:\Users\whatanicedayiana\Documents\CoE197S\ME8_Containerization_and_Docker\5-volumes>
```

Fig. 8. Container is removed